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09/736,073	12/13/2000	David J. Elliott	U/V-102J	7710

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EXAMINER

CROWELL, ANNA M

ART UNIT PAPER NUMBER

1763

DATE MAILED: 03/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/736,073

Applicant(s)

ELLIOTT ET AL.

Examiner

Michelle Crowell

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 January 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14, 16-20 and 23-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14, 17-20 and 23-28 is/are rejected.
- 7) ☒ Claim(s) 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 02 January 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 20.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

In the claims

Claims 15, 21-22, and 30-33 have been cancelled.

Election/Restrictions

1. Applicant's election without traverse of Species I, Figure 2, claims 1-14, 16-20 and 23-29 in Paper No. 7 is acknowledged.

Drawings

2. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on January 2, 2003 have been approved. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

- (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

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1. Claims 1,7-13, 17-20, 24-28 are rejected under 35 U.S.C. 102(a) as being anticipated by Murakami (U.S. 6,090,458).

Referring to Figures 3 and 10, column 3, lines 27-52, column 4, lines 22-36, and column 7, line 55 – column 8, line 17, Murakami discloses an apparatus which uses a rectangular ultraviolet laser beam 30 and reactive gas $\text{Cr}(\text{CO})_6$ to deposit metallic chromium on the substrate 104. The apparatus includes a chamber 103, glass window 111 (UV window) located on the top of chamber 103, beam expander 107 (beam forming module), rectangular ultraviolet laser beam 30, gas inlet port 102 (gas injection module), gas exhaust port connected to exhaust gas treatment 117 (gas exhaust module), heater 125 (heating elements) and X-Y stage 112 for heating and securely holding the substrate (vacuum chuck), dichroic mirror 109 for adjusting the angle of the rectangular beam, laser oscillator 20 (UV radiation source raw output), and object lens 110.

In addition, while the gas inlet and outlet are stationary, the X-Y stage 112 moves the substrate 104 to the desired position for deposition.

Regarding Claims 7-13 and 25

The apparatus of Murakami is capable of administering the various claimed processes with the appropriate processing materials supplied. (i.e. etching reaction, deposition reaction, oxidation reaction, reduction reaction, melting reaction, reaction for modifying a metallic or non-metallic film, polymerization or UV curing reaction, and doping reaction). Furthermore, a claim containing a “recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Accordingly, these claims are anticipated.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 2-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami (U.S. 6,090,458) in view of Elliott et al. (U.S. 5,814,156) and Schmidt et al. (U.S. 4,264,330).

Murakami fails to teach the wavelength of the UV radiation source raw output, energy level of the rectangular beam, optical elements, two cylindrical refractive elements, dimensions of the rectangular beam.

Referring to column 4, lines 4-15, and column 5, lines 53-59, Elliott teaches an apparatus which uses an ultraviolet radiation beam to clean (etch) the surface of a substrate. The laser source 22 provides a pulsed beam 24 (ultraviolet radiation beam) at wavelengths of 248 nm and 193 nm. Typical energy density levels at 248 nm range from 250-1500 mJ/cm² (0.25 – 1.5 J/cm²). The laser source 22 further includes a beam expanding system 26 (beam forming module) made up of two cylindrical mirrors 54 and 56 (two cylindrical refractive elements). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the apparatus of Murakami with the wavelength of the UV radiation source raw output, energy level of the rectangular beam, optical elements, and two cylindrical refractive elements as taught by Elliott. This would ensure the appropriate wavelength and energy level necessary for the

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desired process. In addition, the cylindrical refractive elements (optical elements) create the rectangular beam in the desired dimension.

Referring to column 2, lines 47-52, Schmidt shows an ultraviolet beam 6 directed on vessel 1 with a length of 600 mm and width of 1mm.

In *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the apparatus of Murakami with the dimensions as shown by Schmidt. This would ensure the appropriate dimension of the rectangular beam necessary for the desired process.

4. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami (U.S. 6,090,458) Giapis et al. (U.S. 5,002,631).

Murakami fails to teach a block shaped manifold.

Referring to Figure 1 and column 3, lines 13-15, Giapis teaches a valve-controlled aperture 103 (block shaped manifold) with pump used to exhaust out gaseous reaction products. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the apparatus of Murakami with the valve-controlled aperture as taught by Giapis. This would allow gaseous reaction products to be exhausted.

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5. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami (U.S. 6,090,458) in view of Lee et al. (U.S. 6,374,770).

Murakami fails to teach an electronic control module.

Referring to Figure 1 and column 4, lines 46-50, Lee teaches a CVD apparatus which uses a processor 34 operated by a computer program stored in memory 38 for a deposition reaction. The computer program selects the timing, mixture of gases, chamber pressure, chamber temperature, RF power levels, susceptor position, and other parameters of a particular process. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the apparatus of Murakami in view of Elliott and Schmidt with a processor as taught by Lee. This would control various processing parameters to yield the optimum processing environment for deposition.

6. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami (U.S. 6,090,458) in view of Morishige (U.S. 6,136,096).

The teachings of Murakami have been discussed above.

Murakami fails to teach the gas injection module delivering a second fluid or vapor to the substrate surface.

Referring to Figure 1, column 3, lines 6-17, Morishige teaches an apparatus that uses gases and a laser beam to form layers on the substrate. Two gases ($\text{Cr}(\text{CO})_6$ and TDMAT) are supplied to the substrate 7 through input reservoir 16 and 17. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the apparatus of

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Murakami in view of Elliott and Schmidt with a second fluid to the substrate as taught by Morishige. This would allow multiple, different layers to be deposited on the substrate.

Allowable Subject Matter

7. Claim 16 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

8. Applicant's arguments filed January 2, 2003 have been fully considered but they are not persuasive.

Applicant has argued that Murakami fails to disclose that the gas exhaust module is located inside the chamber.

Murakami satisfies this requirement by providing gas exhaust port inside the chamber 103. The gas exhaust port is part of the exhaust treatment section 117 (exhaust module and Figures 3 and 10 show that the exhaust port is located inside the chamber . The claim does not require that the **entire** gas exhaust module be located inside the chamber.

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Applicant has argued that Murakami fails to disclose that the gas injection module and gas exhaust module are in close proximity to the rectangular beam.

Murakami satisfies this requirement by providing the gas exhaust port of the exhaust treatment section 117 (gas exhaust module) and the gas inlet port 102 (gas injection module) in close proximity to the rectangular beam. The term “close proximity” is interpreted broadly. The claim fails to specify how close the gas injection module and the gas exhaust module are to the rectangular beam. In addition, the claim fails to indicate that both the gas injection module and the gas exhaust module are spaced the same distance from the rectangular beam. Thus, the claim does preclude the gas injection module from being closer to the rectangular beam than the gas exhaust module.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Crowell whose telephone number is (703) 305-1956. The examiner can normally be reached on M-F (8:00 - 4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703) 308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

AMC *ame*
February 27, 2003


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